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10/826,558	04/16/2004	Vladimir Lifshits	002139-013510US	2112

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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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12/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/826,558	Applicant(s) LIFSHITS, VLADIMIR	
	Examiner Tony Chuo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-11 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/24/07 has been entered.

Response to Amendment

2. Claims 1, 4-11, and 13-20 are currently pending. Claim 2, 3, and 12 have been cancelled. New claim 20 has been added. Claims 13-19 are withdrawn from further consideration as being drawn to a non-elected invention. The amended claims do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1, 4-11, and 20 are rejected under the following new 112, 102, and 103 rejections.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the limitations "selecting a length of the flow paths so that

substantially no portions of the mixture are above an auto-ignition temperature of the combustible components in the anode gas" and "a length of the first and second flow paths so that substantially all portions of the mixture downstream of the flow paths have a temperature that is below an auto-ignition temperature of the oxidizable component in the anode gas" in claims 5 and 10, respectively, are not supported by the specification.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4, 5, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 4 is indefinite because it depends on cancelled claim 3. For purpose of compact prosecution, claim 4 is construed as being dependent on claim 1.

7. Claim 4 recites the limitation "exchanging heat" in line 1. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 8 recites the limitation "adding oxygen" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 4-8, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Woods et al (US 2002/0006535).

Regarding claims 1, 4, and 20, the Woods reference discloses a method of operating an integrated power module that generates an anode exhaust gas including combustible components comprising: receiving the anode exhaust gas from the fuel cell "118" at an elevated temperature; quenching the temperature of the anode exhaust gas by transferring heat from the anode exhaust gas to the cathode gas (air flow) before the cathode gas is added to the anode exhaust gas, wherein transferring heat comprises forming first and second flow paths "134" & "114" for the anode exhaust gas and the air flow and separating the flow paths by a flexible heat transfer barrier wall "126" to transfer heat between the anode exhaust gas and the air flow so that the temperatures of the anode exhaust gas and the air flow become more equal; adding air flow to the anode exhaust gas to form an oxidizable anode gas mixture inside the combustor "120"; heating the cathode gas by the heat generated by the fuel cell to a temperature at which the combustible components can be catalytically oxidized; catalytically oxidizing the oxidizable anode gas mixture to form an effluent; and heating the effluent by adding additional air and fuel to the combustor to generate additional heat (See paragraphs [0020],[0027],[0044]). Examiner's note: It is inherent that transferring heat from the anode exhaust gas to the cathode gas prior to forming the mixture would result in lower local peak temperatures that develop during forming the mixture.

Regarding claim 5, it is inherent that length of the flow paths would be selected so that no portions of the mixture would be above the auto ignition temperature of the combustible components in the anode gas at at least one of a predetermined highest temperature of and a concentration of combustible components in the anode gas encountered during the operation of the fuel cell in order for combustible components to be catalytically oxidized inside the oxidizer instead of inside the flow paths.

Regarding claims 6 and 7, it also discloses optimizing the performance of the integrated power module by controlling one or more parameters by directing through the one or more valves, conduits, or inlets at least one process enhancer such as but not limited to an oxygen-containing gas, a combustible fuel, water, carbon dioxide, or air (See paragraph [0045]). By controlling the flow of inlet air, inlet fuel, additional air to the combustor, and additional fuel to the combustor, the heat output of heating the air and the heat output of heating the effluent are independently modulated.

Regarding claims 8, it also discloses flowing the anode exhaust gas into the fuel distribution zone "18" and through a perforated surface element "14" which inherently buffers the anode gas prior to adding air to compensate for temporal fluctuations in at least one of the proportion of combustible components in the anode gas and a temperature of the anode gas (See Figure 1B).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 9-11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woods et al (US 2002/0006535) in view of Haltiner, Jr. et al (US 2003/0235733).

The Woods reference discloses a method of operating an integrated power module that generates an anode exhaust gas including combustible components comprising: receiving the anode exhaust gas from the fuel cell "118" at an elevated temperature; quenching the temperature of the anode exhaust gas by transferring heat from the anode exhaust gas to the cathode gas (air flow) before the cathode gas is added to the anode exhaust gas, wherein transferring heat comprises forming first and second flow paths "134" & "114" for the anode exhaust gas and the air flow and separating the flow paths by a flexible heat transfer barrier wall "126" to transfer heat between the anode exhaust gas and the air flow to form a cooled anode exhaust gas; adding air flow to the cooled anode exhaust gas to form an oxidizable anode gas mixture inside the combustor "120"; catalytically oxidizing the oxidizable anode gas mixture to form an effluent; and heating the effluent by adding additional air and fuel to the combustor to generate additional heat (See paragraphs [0020],[0027],[0044]). It also discloses optimizing the performance of the integrated power module by controlling one or more parameters by directing through the one or more valves, conduits, or inlets at least one process enhancer such as but not limited to an oxygen-containing gas, a combustible fuel, water, carbon dioxide, or air (See paragraph [0045]).

Examiner's note: It is inherent that length of the flow paths would be selected so that all portions of the mixture downstream of the flow paths would have a temperature that is below the auto ignition temperature of the combustible components in the anode gas in order for combustible components to be catalytically oxidized inside the oxidizer instead of inside the flow paths. In addition, by controlling the flow of inlet air and inlet fuel, the heat input to the air flow is selected to sufficiently maintain a temperature of the mixture at which the oxidizable component of the anode exhaust gas oxidizes in the combustor.

However, Woods et al does not expressly teach a step of flowing an effluent from the catalytic oxidizer to the fuel cell. The Haltiner reference discloses a step of flowing the effluent "115" from the afterburner "66" to a manifold surrounding stack "44" and "46" (See paragraph [0039]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Woods method of operating an integrated power module to include a step of flowing an effluent from the catalytic oxidizer to the fuel cell in order to more efficiently utilize the heat generated by the combustor to heat the fuel cell during start-up.

Response to Arguments

13. Applicant's arguments, see Remarks/Arguments, filed 9/24/07, with respect to the rejection(s) of claim(s) 1-11 under 35 USC 102 and 103 have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon

further consideration, new ground(s) of rejection are made in view of Woods et al and Haltiner, Jr. et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC


JONATHAN CREPEAU
PRIMARY EXAMINER